State of California
The Resources Agency
Department of Water Resources
Division of Planning and Local Assistance

Quality Assurance Guidelines for Analytical Laboratories

September 1997

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Governor
State of California

Douglas P. Wheeler
Secretary for Resources
The Resources Agency

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Introduction

Each year the Department of Water Resources invests millions of dollars in the collection and analysis of environmental data. To ensure that the quality of the data meets designated standards, DWR developed its Laboratory Services Policy for analytical laboratory work. This document presents that policy, along with the procedures for selecting laboratories to perform environmental analyses for DWR and continuing evaluation of the quality of those laboratory services. These procedures will be updated periodically as performance requirements change.

This document will be useful to DWR Program Managers in planning for new projects. It will also help other agencies that may want to use DWR laboratory services or use the document as a model for procuring and evaluating analytical services for their own programs. ■

Policy

Department of Water Resources Laboratory Services Policy

Historically, DWR's analytical procedures were relatively uncomplicated because of the type of parameters that were monitored (e.g., electrical conductivity, minerals, dissolved solids, etc.). The task of contracting for analytical services was therefore left to individual Program Managers. With this decentralized system, there were no consistent procedures in place to control the cost or the quality of data generated by these laboratories.

More recently, DWR's environmental measurement activities have shifted in emphasis toward collection of data related to sensitive water quality issues involving toxic substances that affect human and environmental health. Concerns about the credibility of the data generated within DWR environmental measurement programs led to the realization that comprehensive quality assurance and quality control evaluations must accompany all such analytical laboratory data. A system of continuing assessment of the quality of the data needed to be instituted and maintained. The Laboratory Services Policy was approved by DWR to address these concerns.

Effective July 1, 1994, the Laboratory Services Policy centralized authority to contract for and control the quality of all analytical laboratory work performed on behalf of DWR.

- With the policy in place, all DWR requests for analytical services must be submitted to Bryte Laboratory. To assist Bryte Laboratory management with their workload planning, sampling plans or other additional information may be provided.

- DWR's Quality Assurance Program, in conjunction with the management and technical personnel of Bryte Laboratory, was directed to develop

master contracts with commercial laboratories to provide services not available through Bryte Laboratory.

- DWR's QA Program, in conjunction with the management and technical personnel of Bryte Laboratory, was directed to maintain continuing assessment and control of the quality of work performed by contract laboratories.

- Bryte Laboratory maintains responsibility for distributing the analytical workload to make efficient use of DWR and contract laboratory equipment and capabilities. Analytical charges are determined by Bryte Laboratory management and, to the extent feasible, will be uniform throughout DWR.

- DWR is in the process of updating and simplifying its paper flow by developing a modern laboratory information management system. This system will be capable of reporting all the quality assurance/ quality control data generated by Bryte Laboratory and contract laboratories. ■

Guidelines

Guidelines for Requesting Analytical Services

Program Managers should consult with Bryte Laboratory in the early stages of planning a new project or expanding an existing one. Program Managers will submit their requests for analytical services to the Bryte Laboratory Chief. Requests should include a sampling plan, types of analyses to be performed, and a description of the data quality objectives for the project.

Data quality is a measure or description of the types and amounts of error associated with the data set. Therefore, data quality objectives are statements of the level of uncertainty the Project Manager is willing to accept in results derived from environmental data. Assistance in defining data quality objectives is available from the Bryte Laboratory Quality Assurance Officer and DWR's QA Program.

A project's data quality objectives will be utilized by Bryte Laboratory and the DWR Quality Assurance Program in evaluating the performance of contract laboratories. The following DWR technical documents may also be consulted:

- *Sampling Manual for Environmental Measurement Projects* (Quality Assurance Technical Document 2)

- *Guidelines for Developing Quality Assurance Project Plans* (Quality Assurance Technical Document 6)

Copies of these documents can be obtained from DWR's Bulletins and Reports, Post Office Box 942836, Sacramento, California 94236-0001; phone (916) 653-1097.

Selection of Contract Analytical Laboratory

Contract Laboratory Certification

Commercial analytical laboratories that perform analyses for DWR must be certified by the Environmental Laboratory Accreditation Program administered by the State of California Department of Health Services. Exceptions may be considered where an analytical method is not certified by ELAP. The contract laboratory (contractor) shall not subcontract any analyses without prior approval by DWR. All quality control, certification, and other requirements of the contractor shall be applicable to subcontractors.

There are instances where no commercial analytical laboratory is ELAP certified for a specific analysis, especially with new methods for new analytes. Some government and university laboratories meet or exceed minimum standards established for certified laboratories, even though they may not be ELAP certified. Such a noncertified laboratory can be used for analytical purposes, provided the laboratory is evaluated properly, meets performance criteria described in this document, and has a record of good QA/QC practices. To provide a complete line of analytical services, Bryte Laboratory regularly participates in interagency agreements with laboratories of municipalities, universities, and other agencies for specialized analytical work.

Invitation for Bid/Request for Proposals

Laboratory analytical services will be contracted through the invitation for bids/request for proposals process. The bid process will consist of a three-stage procedure.

Stage 1: Compliance Documentation and Laboratory QA Manuals

Candidate laboratories will be required to submit proof of compliance with Minority, Women, Disabled Veteran Business Enterprise requirements and a copy of their laboratory QA Manual which should include, but not be limited to, the following:

- A reference to the standard operating procedures for all monitoring and analytical methods
- Written procedures of quality control practices for instruments, equipment, reagents, supplies, and analyses to assure that data generated is of acceptable precision and accuracy
- Qualifications of staff (number and types of positions, educational background, formal training, and experience)
- Adequacy of laboratory facilities (size; number of hoods and sinks; adequacy of lighting, bench space, and storage areas)
- Adequacy of laboratory instrumentation (major equipment suitable for program needs)
- Preventive maintenance of instruments and equipment (e.g., frequency of maintenance, adequate documentation, etc.)
- Sample logging and tracking of standard operating procedures
- Sample preparation (drying, grinding, homogenization, digestion, and extraction)
- Analytical methods (identification of specific methods, detection limits suitable for program needs, availability of raw data; SOPs)
- Laboratory internal quality control (use of blanks, duplicates, matrix spikes, and reference materials; frequency of incorporation of quality control samples; acceptance criteria [i.e., precision, accuracy, etc.] for quality control results; corrective actions; use of control charts; SOPs)
- External quality assurance data (e.g., interlaboratory check samples; participation in

round robin studies such as those conducted by the Environmental Protection Agency, U.S. Geological Survey, and others)

- Laboratory data reports (format, SOPs)
- Sample storage (security, SOPs)
- Turnaround time of analyses suitable for program needs
- Laboratory forms (types, copies included in manual)
- Laboratory safety (type of equipment, condition of equipment, frequency of inspection, availability of a safety plan, SOPs)

Stage 2: Analyses of Performance Evaluation Samples

Candidate laboratories that pass Stage 1 will be required to participate in the analyses of performance evaluation samples and attain an acceptable score determined by the DWR QA Officer. DWR will purchase the samples, and the candidate laboratories will perform the analyses at their own expense. PE samples will also be submitted to a referee laboratory in case there is a dispute about analytical results. Candidate laboratories will be required to submit their PE sample analyses in both hard copies and an electronic format compatible with DWR's database.

Stage 3: Cost Proposal Evaluation

Candidate laboratories that pass Stage 2 will qualify to advance to the cost proposal evaluation. The lowest responsible bidder will be considered for award of the contract. An on-site visit will be conducted before a contract is awarded as part of the final evaluation process. The on-site visit will be to verify that the description of the laboratory facilities in the IFB/RFP is accurate and that the laboratory follows its own QA Manual procedures. The analytical laboratory evaluation form (see Appendix) will be used for this purpose.

Ongoing Performance Evaluation

Contract analytical laboratories and their subcontractors will be required to routinely participate in analyses of performance evaluation samples as part of the continuing performance audit process. The frequency and extent of these audits will be determined by DWR's QA Program in consultation with the Bryte Laboratory QA Officer. DWR has contracted with an independent contractor to provide certified performance evaluation samples to DWR. Other sources of PE samples include agencies such as the DHS, EPA, USGS, National Institute of Standards and Technology, and the National Research Council of Canada.

The PE samples will be submitted to contract laboratories or their subcontractors blind, double blind, or in any other format determined by DWR's Quality Assurance Program. The analytical results reported will be scored either on the basis of USGS "z" scores (with additional penalties for missed analytes and false positives) or on the basis of another standard scoring procedure. In all instances, the laboratory must obtain the minimum score defined by the scoring method. If a laboratory scores below the passing score twice in a row, DWR may terminate the contract or require analytical work to be subcontracted to a laboratory that can meet satisfactory performance.

An example of a scoring system that has been used by DWR is the following:

Total possible points	= 100
Number of analytes	= N per PE sample
Points per analyte	= (100/N) = P
Penalty for missed analyte (Or analyte on contract but not attempted)	= 2P
Penalty for analyte found but not present	= P
Penalty for analyte found but outside certified control limits	= P
Final score	= 100 - Penalty points

This system uses 80 percent as the passing score. A laboratory not meeting the 80 percent requirement would be sent a second performance evaluation sample to analyze at its own expense.

System Audits

System audits (Appendix A) will be conducted at the discretion of DWR's QA Program and Bryte Laboratory QA Officer, who will determine the composition and format of the audits. On-site visits will help ensure that contract laboratories and their subcontractors continue to meet DWR's quality requirements during the term of the contract. See Appendix A for an example of an analytical laboratory audit form. Deficiencies will be documented and discussed with the contract laboratory staff. In addition, laboratory weaknesses identified through DWR's quality assurance performance evaluations will be discussed. Subsequent on-site visits will ensure that the contract laboratory has implemented the recommended or required corrective actions identified in previous on-site visits. If the contract laboratory is unable to implement recommendations to correct quality assurance problems, DWR reserves the right to terminate the contract or to require that analytical work be subcontracted to a laboratory that can meet the quality assurance requirements.

Quality Assurance Practices Required of Analytical Laboratory

The following is a general outline of expected quality assurance practices from a contract laboratory:

- The analytical laboratory is expected to comply with its own internal QA Laboratory Manual.
- All calibration and quality control requirements for a given analytical method will be strictly followed.
- The laboratory will, at DWR discretion, participate in performance evaluation studies for parameters covered by the contract. The laboratory will analyze performance evaluation samples, split samples, and blind samples supplied to the contract laboratory over the term of the contract. The laboratory will follow the instructions provided with these samples.
- The laboratory will operate its own internal quality control program for an overall measure of performance. QC problems will be resolved at the laboratory's expense, including reanalysis of the samples as necessary.

Analytical Laboratory Reporting Requirements

Contract laboratories will be required to provide internal quality control data along with their routine analytical results to ensure that their data are of acceptable quality. These quality control results include duplicate samples results, reference and control standards, blanks, and any other control samples results available. Analytical results must be provided in an electronic format compatible with the Bryte Laboratory information database system. At present this database is in Microsoft Access V2.0 for Windows 3.1. Contract laboratories will be expected to update their databases when newer versions are implemented at Bryte Laboratory.

Analytical results must include the information below as a minimum:

- Precision, as measured by analyses of duplicate samples (for both the environmental samples and the spiked analytes), reported as relative percent difference or relative standard deviation
- Accuracy, as measured by analyses of control samples
- Presentation of the measurement data expressing the limits of uncertainty for the laboratory analytical method in the range of concentrations determined

- Documentation tracing the sample from the field to the final results (chain of custody records)

- Description of the analytical methods used, analyst who performed the analysis, detection and reporting limits

- Data reported only to the number of significant figures consistent with their limits of uncertainty

- Any modification, as well as any new methodology, described in detail, including test results and details of its validation

- Documentation of sample handling, including date sampled, date prepared (if applicable) and date analyzed, to ensure adherence to method holding times

- Case narrative justifying out-of-control data when results are validated with apparent QC problems or exceedances

The contract laboratory's invoice shall be reduced for each of the following that occur:

- Receipt of results of analyses exceeds the agreed-upon turnaround time

- Holding times are exceeded on any samples

- Laboratory does not notify DWR within 24 hours of broken, defective, or missing samples

- Laboratory reports unacceptable batch QC results

In addition, if any of the above occur, the laboratory must pay for resampling and reanalyze new or reserved samples at no charge to DWR. ■

Appendix

Analytical Laboratory
Quality Assurance Evaluation

Laboratory Name: _____ Date: _____

Address:

_____

_____

_____

Director: _____

Telephone Number: _____

Laboratory QA Officer: _____

Telephone Number: _____

Laboratory Certified By: _____

Review Team Members/Affiliation:

_____

_____

_____

_____

DWR QA Officer: _____ Date : _____

Signature

1. Laboratory Organization

Number of staff

professionals _____
technicians _____
clerical _____
computer _____
other _____

(Organization chart should be provided and attached)

2. Laboratory Facilities and Instrumentation

Approximate laboratory size _____ (ft ^{2})

	Adequate	**Inadequate**
Temperature control	_____	_____
Ventilation	_____	_____
Sinks	_____	_____
Lighting	_____	_____
Bench space	_____	_____
Storage for glassware/reagents/ samples/containers	_____	_____
Hoods (100 LFM)	_____	_____
Sample containers labeled	_____	_____
Reagent containers labeled	_____	_____
Sufficient electrical outlets	_____	_____
Available gas/vacuum lines	_____	_____
Distilled/deionized water:		
Conductivity monitored regularly	_____	_____
pH/other parameters monitored	_____	_____
Log maintained	_____	_____

Comments: _____

_____

Basic Laboratory Instrumentation/Equipment:

a.	pH Meter:		
	0.05 unit sensitivity	_____	_____
	Calibrated daily with 2 buffers	_____	_____
	Buffers used only once	_____	_____

Expiration date posted	_____	_____
Calibrations documented	_____	_____
Electrode properly maintained/ stored	_____	_____

Comments:_____

_____

b. Analytical Reagents:

Reagent grade or better	_____	_____
Dated when opened	_____	_____
Stored properly	_____	_____
Expiration date posted	_____	_____

Comments:_____

_____

c. Conductivity Meter:

Calibrated before each use	_____	_____
Calibrated with_____		
Calibrations documented	_____	_____

Comments:_____

_____

d. Analytical Balance:

Sensitivity of 0.1 mg	_____	_____
Positioned on stable base	_____	_____
Annual service contract	_____	_____
Class "S" or "S1" weights for periodic calibration checks	_____	_____
Calibration checks documented	_____	_____

Comments:_____

_____

e. Drying Ovens:

Temperatures monitored	_____	_____
Documentation of temperature when in use	_____	_____

Comments:_____

_____

f. Refrigerators/Freezers:

Monitored daily	_____	_____
Refrigerators at 4 +/- 2 °C		
Records of monitoring with date	_____	_____
-- temperature	_____	_____
-- initials of responsible person	_____	_____
-- acceptable range listed	_____	_____

Comments: _____

_____

g. Water baths:

Maintained at 95 °to 100 °C	_____	_____
Documentation when bath in use	_____	_____

Comments: _____

_____

h. Thermometers:

Certified thermometer (and certificate)	_____	_____
Lab thermometers routinely calibrated	_____	_____
Calibration checks documented	_____	_____

Comments: _____

_____

i. Glassware:

Class "A" type used	_____	_____
Method SOPs used for cleaning	_____	_____

Comments: _____

_____

j. Desiccator:

Desiccant monitored	_____	_____
Desiccant replaced/regenerated regularly	_____	_____

Comments: _____

_____

k. Turbidimeter:

Calibrated with primary/secondary standards	_____	_____
Secondary standards checked quarterly	_____	_____
Calibrations/standards checks documented	_____	_____

Comments: _____

_____

l. Sample containers:

Stored in designated storage area	_____	_____
Area free from contamination	_____	_____
Routinely checked for contamination	_____	_____

Comments: _____

_____

m. Other Equipment:

_____

_____

_____

_____

Major laboratory equipment suitable for program needs **Yes** ____ **No** ____

Item	Model	Number	Age	Maintenance Frequency

Comments: _____

_____

n. Test Method References on hand and available to all personnel:	Yes	No
Standard Methods for the Examination of Water and Wastewater (current version)	____	____
EPA - *Methods for Chemical Analysis of Water and Wastes*	____	____
EPA - *Handbook for Analytical Quality Control in Water and Wastewater Laboratories*	____	____
EPA - *Methods for the Determination of Organic Compounds in Drinking Water* (500's series)	____	____
EPA - *SW 846* 3rd Ed. and Updates I, II, IIA, and IIB	____	____
PAM Manuals, Volume I & II	____	____

Comments: _____

_____

3. Preventive Maintenance

	Yes	No
Equipment manual available near each instrument	____	____
Fume hoods quarterly inspections (up-to-date)	____	____
Log books documenting equipment maintenance available	____	____
Includes:		
date, description of routine maintenance	____	____
all corrective actions documented	____	____
entry signed by technician	____	____
Troubleshooting standard operating procedures available	____	____

Service contracts available for:

Most _____ Some _____ Few _____

Comments: _____

_____

4. Sample Receiving/Storage

a. Sample Security:	Yes	No
Storage facilities secured	____	____
Locked storage area for litigation samples	____	____

Comments: _____

_____

b.	Sample Receiving:	**Yes**	**No**
	Designated area for receiving samples	____	____
	Size of area adequate	____	____
	Area includes facilities for preserving samples	____	____
	Location minimizes potential contamination	____	____
	Location provides easy access to sample storage area(s)	____	____
	Area organized for efficient processing/preserving	____	____
	Sample integrity and/or identity maintained	____	____
	Designated individual for sample receiving	____	____
	Written SOP available for sample receiving	____	____
	Written SOP available for chain-of-custody	____	____

Comments: _____

_____

c.	Sample Identification/Record Keeping:		
	Sample receiving log maintained	____	____
	Receiving log includes:		
	--Time and date sampled	____	____
	--Time and date received at laboratory	____	____
	--Sample collector	____	____
	--Nature of sample (matrix identified)	____	____
	--Analyses to be performed	____	____
	--Preservatives in/added to sample	____	____
	--Condition of samples recorded	____	____
	--Sample transport methods documented	____	____
	--Information on container documented	____	____
	--Sample recipient	____	____
	Lab ID assigned and recorded	____	____
	Computer log-in system in place	____	____
	--Backup system available	____	____
	Hard copies of all files available	____	____
	Chain-of-Custody Forms Include:		
	Project name/manager	____	____
	Laboratory name	____	____
	Field/Lab ID	____	____
	Matrix type	____	____
	Number of containers	____	____
	Analyses requested	____	____
	Adequate signature space	____	____

Comments:

_____

_____

d.	Posted Instructions:	Yes	No
	In sample receiving area for		
	--Sample preservation	____	____
	--Proper containers	____	____
	--Holding time requirements	____	____

Comments: _____

_____

e.	Preservatives, Containers, Storage and Holding Times:		
	Samples collected in proper containers	____	____
	Samples preserved with appropriate preservatives	____	____
	--Preservatives indicated on sample container	____	____
	Samples stored properly	____	____
	Samples analyzed within the required holding time limit	____	____

Comments: _____

_____

f. Sample Tracking System:

Follow a sample (or samples) progress through the laboratory from receipt to reporting of final data.

Sample(s) traced (ID) _____

_____

Tracking system in place	____	____
System monitors holding times	____	____
Sample tags attached	____	____

Comments: _____

_____

g.	Storage Facilities:		
	Adequate facilities to store all samples properly	____	____
	Samples stored to minimize cross contamination	____	____
	Drinking water VOA samples in separate refrigerator	____	____
	Hazardous waste samples stored separately	____	____
	Refrigerators maintained at 4 +/- 2 ^{o}C	____	____
	Storage temperatures monitored and documented	____	____

Comments: _____

_____

5. Sample Preparation (digestion/extraction)

	Yes	No
Written SOPs available	____	____

Comments: _____

_____

6. Calibration Procedures

	Yes	No
Reagents	____	____
Date of receipt or preparation shown	____	____
Analyst preparing reagents identified	____	____
Proper storage	____	____
Vendor source identified	____	____
Written SOPs for calibration documented	____	____
Blanks and standards prepared using same reagents	____	____
as for production samples	____	____

Analytical range _____

Frequency of blank/ calibration standard analysis _____

Acceptance criteria documented for analyst	____	____
Corrective action documented	____	____
Initial and final calibration of standards within 15%	____	____
Blanks less than the detection limit	____	____
Control charts used	____	____
Calibration problems documented in analyst notebook	____	____

Storage _____

Range of standards appropriate _____

Comments: _____

_____

7. Analytical Method (for Each Field of Testing)

Field of Testing:_____

	Yes	No
Instrument appropriate for analytes/matrix	____	____
Instrument in good operating condition	____	____
Written SOPs of methodology available at each analyst's station	____	____
Have methods been modified?	____	____
Validation information on file	____	____

Method Detection limits (matrix)_____ Last updated_____

Method Detection limits (matrix)_____ Last updated_____

Method Detection limits (matrix)_____ Last updated_____

Average sample backlog_____
Analysis conducted within_____days of receipt

Analysts' notebooks available:	____	____
entries made in ink	____	____
corrections crossed through	____	____
analysts identified	____	____
date documented	____	____
Raw data on file	____	____
Weights, volumes recorded		
Date, time, procedure entered	____	____
Instrument parameters recorded	____	____
Analyst's initial or signature	____	____
Calibration run referenced	____	____
Notes on SOP modifications recorded	____	____

Comments: _____

_____

8. Quality Control (Internal)

	Yes	**No**
Written SOPs available	____	____
Control charts available for:		
--blanks	____	____
--duplicates	____	____
--spikes	____	____
--standard reference material	____	____
--calibration standards	____	____
--other_____	____	____
Blanks/Duplicates/Spikes		
--Frequency of each _____		
Acceptance criteria available to analyst	____	____
Corrective action known by laboratory personnel obtained	____	____

Estimated percent passed on first run _____

Percent of sample loads:
--standards_____
--blanks _____ duplicates _____
--spikes_____blind reference samples_____

Completeness:	____	____
Acceptance criteria available	____	____
Corrective action available	____	____

QA reports prepared and problems documented in writing	____	____
QA reports reviewed by Lab Director prior to submittal of report	____	____

Comments: _____

_____

9. Safety	**Yes**	**No**
a. Safety Equipment:		
--Fire extinguishers/fire blankets	____	____
--Safety shower	____	____
--Spill kits	____	____
--Eye wash	____	____
--First aid kit(s)	____	____
--Safety glasses	____	____

Comments: _____

_____

b. Safety Habits:		
Lab coats worn	____	____
Safety glasses worn	____	____
Walkways clear	____	____
Work areas clean	____	____
Safety data sheets filed	____	____

Comments: _____

_____

c. Distillation, Solvent Extraction, and Acid Digestion Procedures:		
Performed under hoods	____	____
Hoods have proper flow (100 LFM)	____	____
Hoods monitored on regular basis	____	____
Monitoring documented	____	____

Comments: _____

_____

d. Chemical Storage Shelving and Gas Cylinders:		
Shelves have earthquake railings	____	____
Gas cylinders secured	____	____
Explosive gas cylinders grounded	____	____

Comments: _____

_____

e. Solvents and Acids Storage:

Solvents stored in flammable storage cabinets	____	____
Acids stored in acid resistant cabinets	____	____
Acid neutralizers available nearby	____	____
Organic extracts stored in explosion-proof refrigerators	____	____

Comments: _____

_____

f. Hazardous Wastes Handling:

Hazardous wastes stored properly	____	____
--Reactive wastes isolated	____	____
--Acid waste neutralized	____	____
Hazardous wastes disposed of properly	____	____
Waste disposal contract in place	____	____

Comments: _____

_____

10. External Quality Assurance

	Yes	**No**
Interlaboratory duplicates	____	____
Percent of external QA samples per batch	____	____
Acceptance criteria (obtained)	____	____
Corrective action (obtained)	____	____

Interlaboratory Participation:

Sponsoring Agency	Sample Types	Performance Results
_____	_____	_____
_____	_____	_____
_____	_____	_____

	Yes	**No**
Reports Available	____	____

Comments: _____

_____

11. Records/Data Retention

	Yes	**No**
a. Data Retention Requirements:		
Complete records of regulatory analyses maintained	____	____
Records retained per client requirements	____	____
Instrument printouts, chart recordings, and chromatograms retained	____	____

Comments: _____

_____

b. Raw Data:

Maintained on worksheets and/or permanently bound lab books	____	____
Entries made in indelible ink	____	____
Corrections made by crossing out entries	____	____
Corrections initialed by analyst	____	____

Comments: _____

_____

c. Data Review:

Data checked by second analyst	____	____
Documentation of second analyst data check	____	____

Comments: _____

_____

d. Corrective Action:

Documentation of corrective actions in out-of-control situations	____	____
Documentation includes		
--date	____	____
--analyst	____	____
--samples affected	____	____
--problem	____	____
--resolution	____	____

Comments: _____

_____

e. Data Reduction:

Dilution factors taken into account	____	____
Interferences noted	____	____
Bias corrections made on data	____	____
--If so, uncorrected values are included	____	____
Appropriate use of significant figures	____	____

Comments: _____

_____

f. Notification and Reporting Procedures:
Do data reports include the following

--Identification of the laboratory	_____	_____
--Identification of the client/program	_____	_____
--Complete sample identification	_____	_____
--Date of sample collection	_____	_____
--Date sample received by laboratory	_____	_____
--Date of sample analysis	_____	_____
--Name of analytical method	_____	_____
--Analytical values including units of measure	_____	_____
--Limits of detection	_____	_____
--Date of report	_____	_____
--Original signature by a signatory person	_____	_____

Samples stored for how long following submittal of reports _____

Comments: _____

_____

12. Quality Assurance Plan	**Yes**	**No**
Quality Assurance Plan in place	_____	_____
Date of most recent update _____		
Plan accessible to all analysts	_____	_____
Laboratory personnel familiar with plan	_____	_____
Plan describes actual laboratory practices	_____	_____

Comments: _____

_____